



What is CINT?

The proposed Department of Energy's Center for Integrated Nanotechnologies (CINT) is chartered to combine the expertise of Los Alamos National Laboratory, Sandia National Laboratories and the University of New Mexico. CINT's goals are to explore the emerging science of nanotechnology—from scientific discovery all the way to integration of new technologies to improve people's lives—and to educate a new generation of scientists.

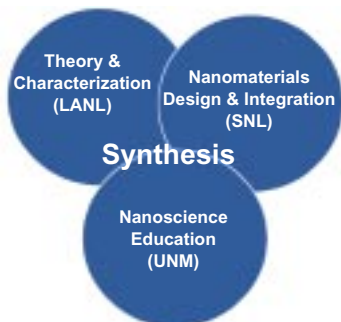
Origins of CINT

CINT is one of five DOE-proposed Nanoscale Science Research Centers (NSRCs) to be located across the country. The NSRC complex is planned to become a cornerstone of the nation's nanotechnology revolution, contributing to DOE's principal missions in national defense, energy and the environment, while providing an invaluable resource for universities and industry.



CINT: Three Integrated Institutions

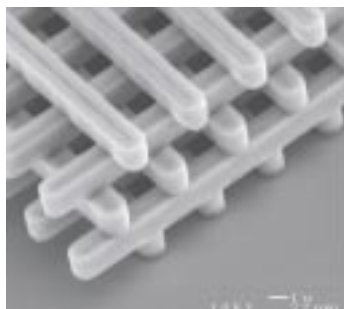
CINT will call upon the strengths of the three participating institutions, synthesizing them into a single, cohesive effort.



Three integrated sites

CINT's Scientific Thrusts

CINT's initial scientific thrusts will build upon the participating institutions' strengths.



A three-dimensional photonic crystal fabricated from silicon

Nanophotonics and Nanoelectronics

- **Vision:** Focus on nanoscale structuring of semiconductors and dielectrics.
- **Applications:** Ultra small lasers, ultrafast electronics, ultrafast computers, optical telecommunications, biological-based electronics, medicine, sensing, solid-state lighting and novel photovoltaics.

Complex Functional Nanomaterials

- **Vision:** Use novel synthesis approaches to mix multiple materials into structures with new properties and functions.

- **Applications:** Integrate robust nanocomposite architectures into electronic and photonic devices, chemical sensors, dielectric and magnetic sensors, and sensor arrays.

Nanomechanics

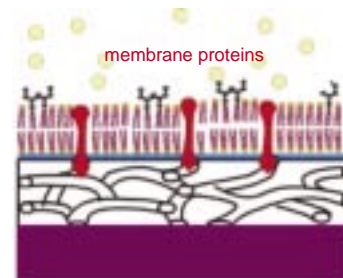
- **Vision:** Integration of nanostructured materials within microscale architectures.
- **Applications:** Integrated systems that couple mechanical response to optical, magnetic, electrical, and chemical stimuli at the nano- and micro-scale. Enhance micromachine performance, nano devices and strengthened nanocomposite materials.



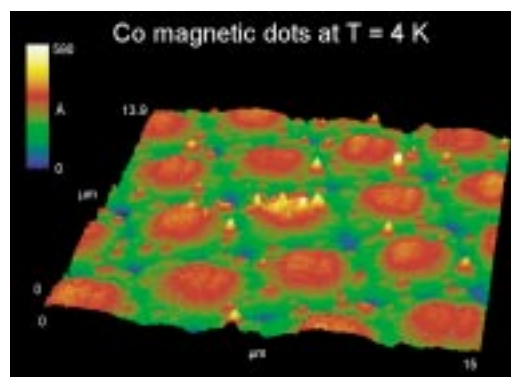
Actual polysilicon pull-tab specimen

Nano-Bio-Micro Interfaces

- **Vision:** Establish the scientific underpinnings for future technologies with nanoscale interfaces between biological systems and inorganic materials.
- **Applications:** Biosensors, biomedical implants, bio-assisted fabrication of photonic and electronic materials and bio-inspired energy/signal transduction processes.



New biosensor concepts



Nanoscience efforts push the boundaries of materials research.

CINT: Two New Proposed Facilities

CINT will rely upon the existing strengths of the three institutions and also build two new facilities, one in Los Alamos and one in Albuquerque.



Neutron scattering instrument at the LANSCE Lujan Center

- **Los Alamos: Integrated Theory, Synthesis and Characterization Laboratory (ITSCL)—**

A proposed laboratory will provide an integrative environment for discovery of new nanostructures, materials, and properties by coupling advanced theory, synthesis and characterization and utilization of the Los Alamos Neutron Science Center (LANSCE) and the National High Magnetic Field Laboratory for nanoscale research. The ITSCL is currently proposed to be 40,000 square feet.



NHMFL at Los Alamos, pulsed field study

- **Albuquerque: NanoFabrication and Integration Laboratory (NFIL)—**A proposed laboratory will provide a flexible fabrication and integration environment for design, synthesis, assembly and performance evaluation of nanoscale materials and structures. The NFIL is currently proposed to be 60,000 square feet.

Since 1943, Los Alamos has created and applied advanced science and technology to solve critical challenges in national defense and civilian research.

Quick Facts on CINT at Los Alamos

Proposal

- Los Alamos, Sandia and UNM submitted a proposal to DOE in Dec. 2000 and received funding for preconceptual design work for the center.

FY01 Budget

- \$150k Los Alamos, \$150k Sandia, \$75k UNM.

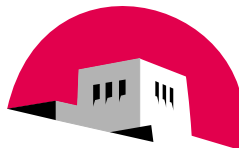
Construction

- Planned for as early as fiscal year 2002.

CINT Contact Information:

Deputy Director Materials
Science and Technology
Don Parkin
Tel: (505) 665-1131
Fax: (505) 665-4584
Email: dmp@lanl.gov

Web site
<http://www.lanl.gov/mst/nano/>



The University of New Mexico

Los Alamos
NATIONAL LABORATORY

*Los Alamos National Laboratory
is operated by the
University of California for the
U.S. Department of Energy's National
Nuclear Security Administration*